OIPE
NOV 21 2002
PATENT & TRADEMARK OFFICE

RECEIVED
NOV 26 2002
TECH CENTER 1600/2900

APPROVED BY DRAFTSMAN | O.G. FIG. | CLASS | SUBCLASS

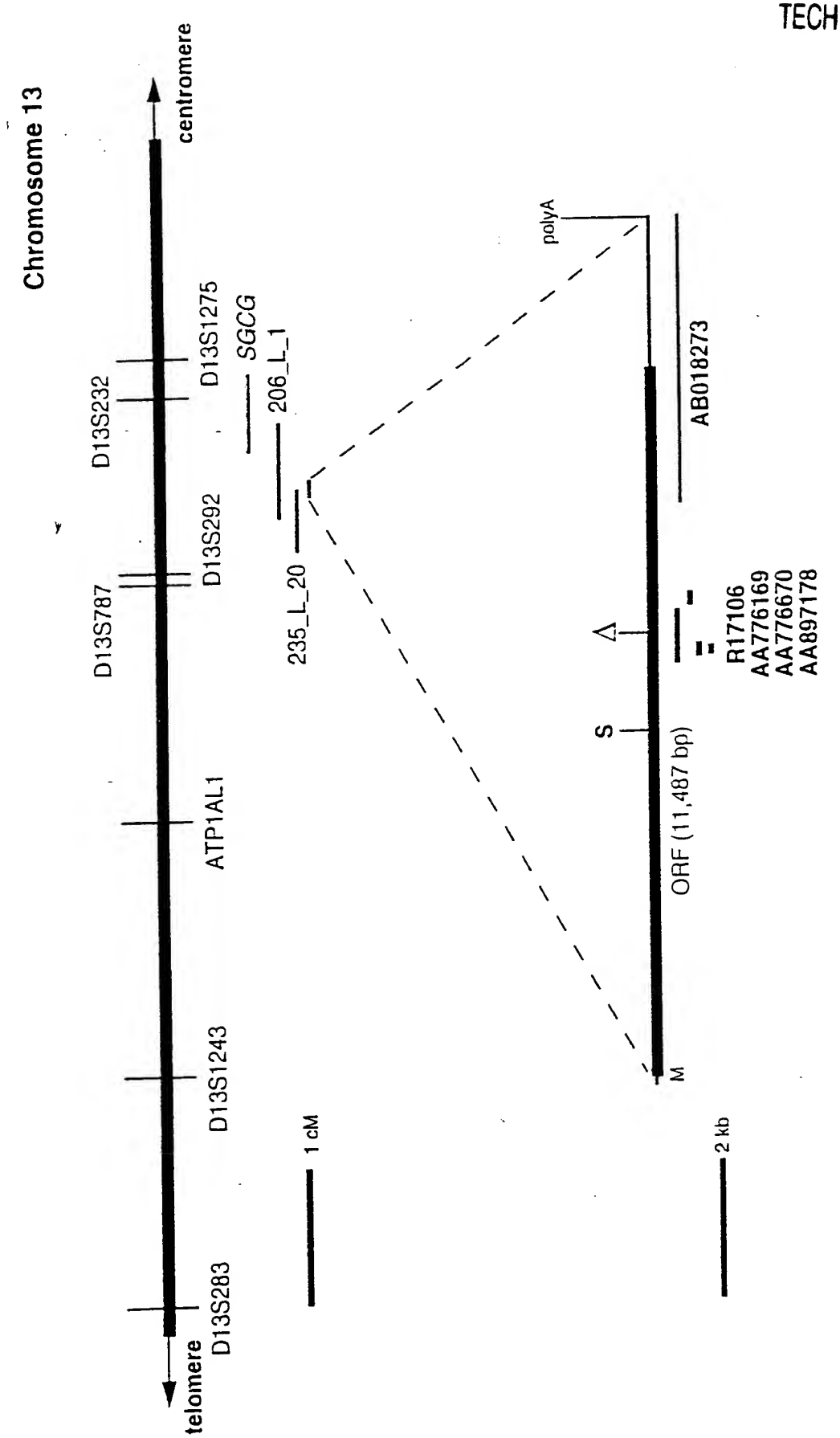
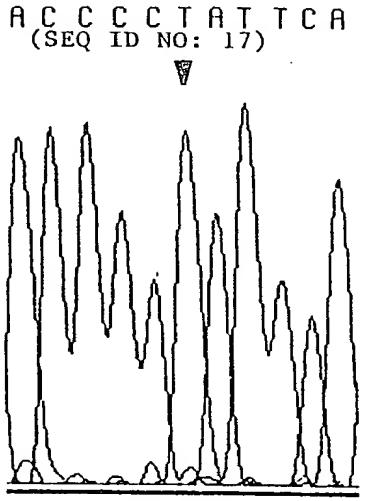


Figure 1

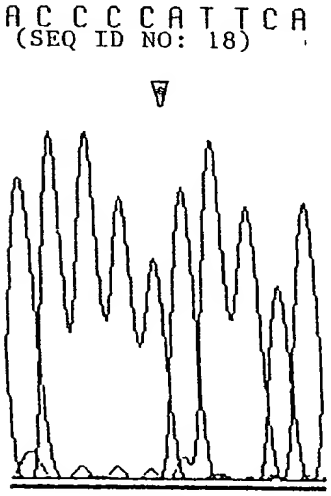
OIPE
NOV 21 2002
PATENT & TRADEMARK OFFICE
JC08

RECEIVED
NOV 26 2002
TECH CENTER 1600/2900

APPROVED BY DRAFTSMAN | O.G. FIG. | CLASS | SUBCLASS



6594T



6594Δ

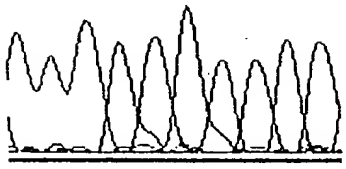
Figure 2A

OIPE
NOV 21 2002
PATENT & TRADEMARK OFFICE
JC99

RECEIVED
NOV 26 2002
TECH CENTER 1600/2900

APPROVED | BY | DRAFTSMAN | CLASS | SUBCLASS
O.G. Fig.

A A A G C G A C A C
(SEQ ID NO: 19)



5254C

A A A G N G A C A C
(SEQ ID NO: 20)

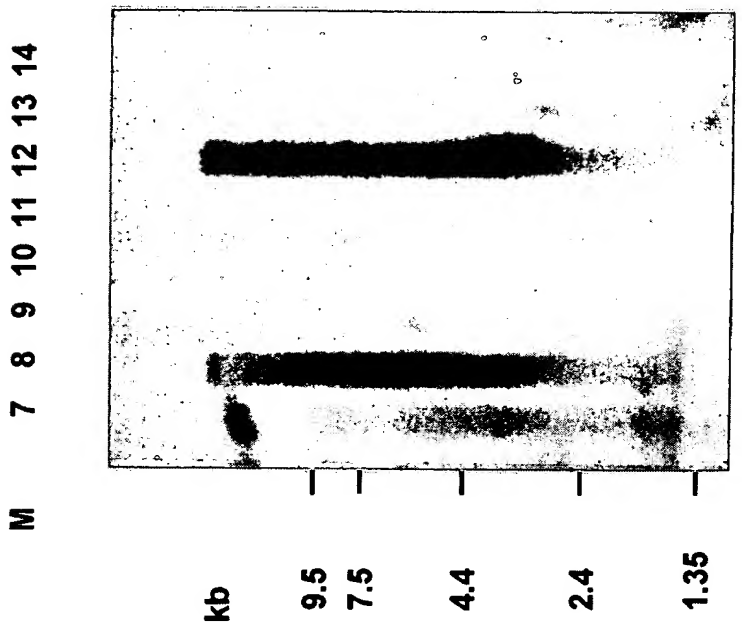
5254C/T

Figure 2B

O·I·P·E
NOV 21 2002
PATENT & TRADEMARK OFFICE

RECEIVED
NOV 26 2002
TECH CENTER 1600/2900

APPROVED BY DRAFTSMAN | O.G. FIG. | CLASS | SUBCLASS



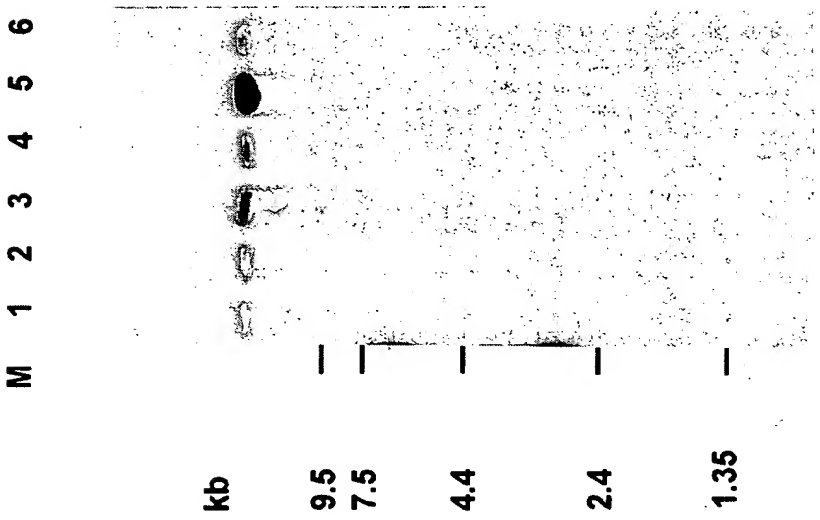


Figure 3

OIPE
NOV 21 2002
PATENT & TRADEMARK OFFICE

RECEIVED
NOV 26 2002
TECH CENTER 1600/2900

APPROVED BY DRAFTSMAN | O.G. FIG. | CLASS | SUBCLASS

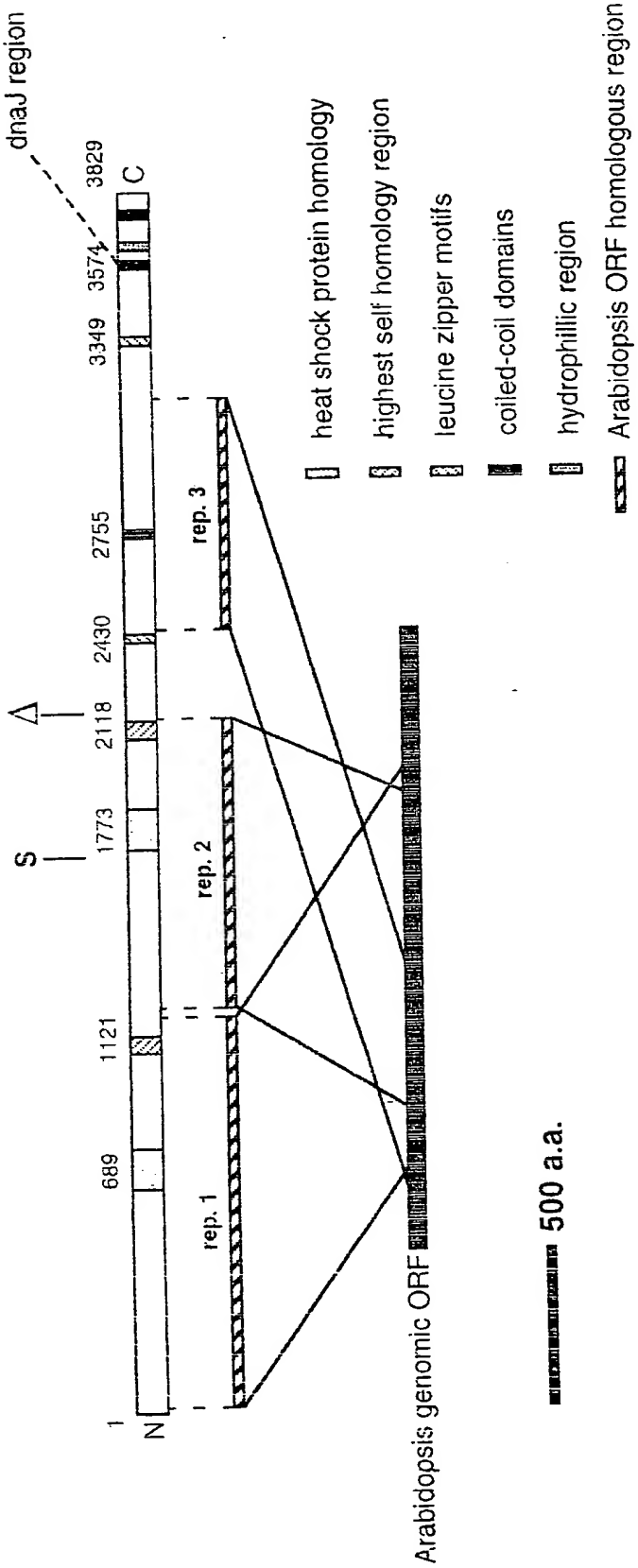


Figure 4A

APPROVED BY DRAFTSMAN | O.G. FIG. | CLASS | SUBCLASS

PATENT & TRADEMARK OFFICE OIPE NOV 21 2002

App No.: 09/693,205
Title: Identification of ARSACS
Inventors: Thomas J. Hudson, *et al.*

```
HUMAN-REP 1          705    GQREPLTVRIKNILEEYPSVSDIFKEILQNADQAN-ATECSFLIDMRRNMDIRENLLDPG
MOUSE-REP 1          705    GQREPLTVRIKNILEEYPSVSDIFKEILQNADQAN-ATECSFmIDMRRNMDIRENLLDPG
HUMAN-REP 2          1773   GqkE.LT.RIK.IL..YPS..em.KEILQNADQA..ATE..Fv.D.R......d.i.D..
ARABIDOPSIS          987    GQhE.LT.RIK.ILE.Y.....I..EIvQNAeQA..AsE.tFLlD..h.....d.LL.P.
HSP90 (YEAST)        18     .Q.E..l....I...Y.......rELi.NA.OA........L.D.k......d..i...

HUMAN-REP 1          764    MAACHGPALWSFNNSQ-FSDSDFVN----ITRLG-----ESLKRGE-VDKVGKFGLGFNS
HUMAN-REP 1          764    MAACHGPALWSFNNSe-FSDSDFIN....ITRLG.....ESLKRGE-VDKVGKFGLGFNS
HUMAN-REP 2          1830   .A...GPAL..yNN...Fte.D.......I..LG........K.G....K.G.yGiGFNS
ARABIDOPSIS          1044   MA...GPALy.FNNS..Ft..D.......IsRiG.....qa.K.......iGrPGLGFN.
HSP90 (YEAST)        78     ........L...d.....t.ae.iN....I.k.G.....EaL..G..V..iG.FGvGF.S

HUMAN-REP 1          813    VYHITDIPIIMSR--------------EFMIMFDP
MOUSE-REP 1          813    VYHITDIPIIMSR..............EFMIMFDP
MOUSE-REP 2          1879   VYHITD.P..iS................d.l.iFD.
ARABIDOPSIS          1093   VYH.TDIP..vS................E.ivMFDP
HSP90 (YEAST)        137    If.v.D...viSk..............F.v..D.
```

Underline = conserved
Bold = identical

Figure 4B

RECEIVED
NOV 26 2002
TECH CENTER 1600/2900

OIPE
NOV 21 2002
PATENT & TRADEMARK OFFICE
JC99

RECEIVED
NOV 26 2002
TECH CENTER 1600/2900

APPROVED BY DRAFTSMAN | O.G. FIG. CLASS SUBCLASS

```
MNTFWPGRELIVQWYPFDENRNHPSVSWLKMVWKNLYIHFSEDLTLFDEMPLIPRTILEE      60
.........V......S.DKR...L.............................L.N.

GQTCVELIRLRIPSLVILDDESEAQLPEFLADIVQKLGGFVLKKLDASIQHPLIKKYIHS     120
D............V......T................I...R..T......V......

PLPSAVLQIMEKMPLQKLCNQITSLLPTHKDALRKFLASLTDSSEKEKRIIQELAIFKRI     180
.....I......I.........A.....................T...........T.....

NHSSDQGISSYTKLKGCKVLHHTAKLPADLRLSISVIDSSDEATIRLANMLKIEQLKTTS     240
...................D......T.....V....................K.....

CLKLVLKDIENAFYSHEEVTQLMLWVLENLSSLKNENPNVLEWLTPLKFIQISQEQMVSA     300
...F.....G....TQ.........I...........S...D..M.....HM..GHV.A.

GELFDPDIEVLKDLFCNEEGTYFPPSVFTSPDILHSLRQIGLKNEASLKEKDVVQVAKKI     360
.D.........R..Y...EAC...TI..................S...........R..

EALQVGACPDQDVLLKKAKTLLLVLNKNHTLLQSSEGKMTLKKIKWVPACKERPPNYPGS     420
.....SS.QN....M.............Q..........A.....................

LVWKGDLCNLCAPPDMCDVGHAILIGSSLPLVESIHVNLEKALGIFTKPSLSAVLKHFKI     480
..................AA..V.V.........V.....Q..S.....TIN.......T

VVDWYSSKTFSDEDYYQFQHILLEIYGFMHDHLNEGKDSFRALKFPWVWTGKKFCPLAQA     540
.....T............................S......K...........N.......

VIKPIHDLDLQPYLHNVPKTMAKFHQLFKVCGSIEELTSDHISMVIQKIYLKSDQDLSEQ     600
....T.........Y..............A..................V......E...E

ESKQNLHLMLNIIRWLYSNQIPASPNTPVPIHHSKNPSKLIMKPIHECCYCDIKVDDLND     660
............M..................Y..R.....V...................

LLEDSVEPIILVHEDIPMKTAEWLKVPCLSTRLINPENMGFEQSGQREPLTVRIKNILEE     720
.....................................................................

YPSVSDIFKELLQNADDANATECSFLIDMRRNMDIRENLLDPGMAACHGPALWSFNNSQF     780
.........................M.................................E.

SDSDFVNITRLGESLKRGEVDKVGKFGLGFNSVYHITDIPIIMSREFMIMFDPNINHISK     840
.....L.....................................................

HIKDKSNPGIKINWSKQQKRLRKFPNQFKPFIDVFGCQLPLTVEAPYSYNGTLFRLSFRT     900
....R.....................................A...................

QQEAKVSEVSSTCYNTADIYSLVDEFSLCGHRLIIFTQSVKSMYLKYLKIEETNPSLAQD     960
.........................................N.....................

TVIIKKKSCSSKALNTPVLSVLKEAAKLMKTCSSSNKKLPSDEPKSSCILQITVEEFHHV    1020
.I.....V.P.....A.........................T.V...................

FRRIADLQSPLFRGPDDDPAALFEMAKSGQSKKPSDELSQKTVECTTWLLCTCMDTGEAL    1080
...................T.................P....D.....I...........

KFSLSESGRRLGLVPCGAVGVQLSEIQDQKWTVKPHIGEVFCYLPLRIKTGLPVHINGCF    1140
....N..............L.H.T.E.........................I.......

AVTSNRKEIWKTDTKGRWNTTFMRHVIVKAYLQVLSVLRDLATSGELMDYTYYAVWPDPD    1200
.................................A.........IG...T.............

LVHDDFSVICQGFYEDIAHGKGKELTKVFSDGSTWVSMKNVRFLDDSILKRRDVGSAAFK    1260
..........K..............R......M..............Q.K.........

IFLKYLKKTGSKNLCAVELPSSVKLGFEEAGCKQILLENTFSEKQFFSEVFFPNIQEIEA    1320
.........................A.....................................

ELRDPLMIFVLNEKVDEFSGVLRVTPCIPCSLEGHPLVLPSRLIHPEGRVAKLFDIKDGR    1380
.......N......L.....I......V.........................T....

FPYGSTQDYLNPIILIKLVQLGKAKDDILWDDMLERAVSVAEINKSDHVAACLRSSILLS    1440
.....................M.............E..........A...........
```

Figure 5A

OIPE
NOV 21 2002
PATENT & TRADEMARK OFFICE
JC99

RECEIVED
NOV 26 2002
TECH CENTER 1600/2900

O.G. FIG.
CLASS
SUBCLASS
APPROVED BY DRAFTSMAN

```
LIDEKLKIRDPRAKDFAAKYQTIRFLPFLTKPAGFSLDWKGNSFKPETMFAATDLYTAEH      1500
........K.............P.............E.............I....Y

QDIVCLLQPILNENSHSFRGCGSVSLAVKEFLGLLKKPTVDLVINQLKEVAKSVDDGITL      1560
.....................................................Q.....

YQENITNACYKYLHEALMQNEITKMSIIDKLKPFSFILVENAYVDSEKVSFHLNFEAAPY      1620
...............VL...MA.AT..E.....C......V..E.............

LYQLPNKYKNNFRELFETVGVRQSCTVEDFALVLESIDQERGTKQITEENFQLCRRIISE      1680
...............S......F...............K.............

GIWSLIREKKQEFCEKNYGKILLPDTNLMLLPAKSLCYNDCPWIKVKDTTVKYCHADIPR      1740
.........R.................L.................S.....

EVAVKLGAVPKRHKALERYASNVCFTTLGTEFGQKEKLTSRIKSILNAYPSEKEMLKELL      1800
.........I.............I...A.............................

QNADDAKATEICFVFDPRQHPVDRIFDDKWAPLQGPALCVYNNQPFTEDDVRGIQNLGKG      1860
.....................................................

TKEGNPYKTGQYGIGFNSVYHITDCPSFISGNDILCIFDPHARYAPGATSISPGRMFRDL      1920
......C...H.....................G.............V.....

DADFRTQFSDVLDLYLGTHFKLDNCTMFRFPLRNAEMAKVSEISSVPASDRMVQNLLDKL      1980
...............N.................Q........S.....

RSDGAELLMFLNHMEKISICEIDKSTGALNVLYSVKGKITDGDRLKRKQFHASVIDSVTK      2040
....................A..G.............................

KRQLKDIPVQQITYTMDTEDSEGNLTTWLICNRSGFSSMEKVSKSVISAHKNQDITLFPR      2100
.....................................................

GGVAACITHNYKKPHRAFCFLPLSLETGLPFHVNGHFALDSARRNLWRDDNGVGVRSDWN      2160
.....................................................

NSLMTALIAPAYVELLIQLKKRYFPGSDPTLSVLQNTPIHVVKDTLKKFLSFFPVNRLDL      2220
.....................................................

QPDLYCLVKALYNCIHEDMKRLLPVVRAPNIDGSDLHSAVIITWINMSTSNKTRPFFDNL      2280
...........S.....................................................

LQDELQHLKNADYNITTRKTVAENVYRLKHLLLEIGFNLVYNCDETANLYHCLIDADIPV      2340
.....................................................V.....

SYVTPADIRSFLMTFSSPDTNCHIGKLPCRLQQTNLKLFHSLKLLVDYCFKDAEENEIEV      2400
.......V.....................................................S.F..

EGLPLLITLDSVLQTFDAKRPKFLTTYHELIPSRKDLFMNTLYLKYSNILLNCKVAKVFD      2460
.............I..G.............................SV.....

ISSFADLLSSVLPREYKTKSCTKWKDNFASESWLKNAWHFISESVSVKEDQEETKPTFDI      2520
..................N.A.........................TD....P..A..V

VVDTLKDWALLPGTKFTVSANQLVVPEGDVLLPLSLMHIAVFPNAQSDKVFHALMKAGCI      2580
I..I..............TS..........I.....................

QLALNKICSKDSAFVPLLSCHTANIESPTSILKALHYMVQTSTFRAEKLVENDFEALLMY      2640
.............L..........D..A.....V..........T...M.....

FNCNLNHLMSQDDIKILKSLPCYKSISGRYVSIGKFGTCYVLTKSIPSAEVEKWTQSSSS      2700
.....S.....................M..A.....................

AFLEEKIHLKELYEVIGCVPVDDLEVYLKHLLPKIENLSYDAKLEHLIYLKNRLSSAEEL      2760
......V........L.....................................A.I..P

SEIKEQLFEKLESLLIIHDANSRLKQAKHFYDRTVRVFEVMLPEKLFIPNDFFKKLEQLI      2820
..................N.........................KE.......V.

KPKNHVTFMTSWVEFLRNIGLKYILSQQQLLQFAKEISVRANTENWSKETLQNTVDILLH      2880
....QAA..............A.........................S.....
```

Figure 5B

OIPE
NOV 21 2002
PATENT & TRADEMARK OFFICE
JC699

RECEIVED
NOV 26 2002
TECH CENTER 1600/2900

O.G. FIG.
CLASS
SUBCLASS
APPROVED BY DRAFTSMAN

```
HIFQERMDLLSGNFLKELSLIPFLCPERAPAEFIRFHPQYQEVNGTLPLIKFNGAQVNPK  2940
.............................Y.........................

FKQCDVLQLLWTSCPILPEKATPLSIKEQEGSDLGPQEQLEQVLNMLNVNLDPPLDKVIN  3000
.............................A.........................

NCRNICNITTLDEEMVKTRAKVLRSIYEFLSAEKREFRFQLRGVAFVMVEDGWKLLKPEE  3060
............................................................

VVINLEYESDFKPYLYKLPLELGTFHQLFKHLGTEDIISTKQYVEVLSRIFKNSEGKQLD  3120
........A...................................S.......

PNEMRTVKRVVSGLFRSLQNDSVKVRSDLENVRDLALYLPSQDGRLVKSSILVFDDAPHY  3180
..............K.............A...........K.............

KSRIQGNIGVQMLVDLSQCYLGKDHGFHTKLIMLFPQKLRPRLLSSILEEQLDEETPKVC  3240
............................................................

QFGALCSLQGRLQLLLSSEQFITGLIRIMKHENDNAFLANEEKAIRLCKALREGLKVSCF  3300
............................................................

EKLQTTLRVKGFNPIPHSRSETFAFLKRFGNAVILLYIQHSDSKDINFLLALAMTLKSAT  3360
............................................................

DNLISDTSYLIAMLGCNDIYRIGEKLDSLGVKYDSSEPSKLELPMPGTPIPAEIHYTLLM  3420
....................S.....................................

DPMNVFYPGEYVGYLVDAEGGDIYGSYQPTYTYAIIVQEVEREDADNSSFLGKIYQIDIG  3480
.....................................................T......

YSEYKIVSSLDLYKFSRPEESSQSRDSAPSTPTSPTEFLTPGLRSIPPLFSGRESHKT-S  3540
.................D....N.....T.....................K....SP.

SKHQSPKKLKVNSLPEILKEVTSVVEQAWKLPESERKKIIRRLYLKWHPDKNPFNHDIAN  3600
T..H..R.....A.............................................____

EVFKHLQNEINRLEKQAFLDQNADRASRRTFSTSASRFQSDKYSFQRFYTSWNQEATSHK  3660
_____.....................................__________

SERQQQNKEKCPPSAGQTYSQRFFVPPTFKSVGNPVEARRWLRQARANFSAARNDLHKNA  3720
_____S___.....................................................

NEWVCFKCYLSTKLALIAADYAVRGKSDKDVKPTALAQKIEEYSQQLEGLTNDVHTLEAY  3780
.....................................__________________

GVDSLKTRYPDLLPFPQIPNDRFTSEVAMRVMECTACIIIKLENFMQQKV            3830
.............................................I....
```

Figure 5C

APPROVED BY DRAFTSMAN | O.G. FIG. | CLASS | SUBCLASS

OIPE NOV 21 2002 PATENT & TRADEMARK OFFICE 1600

Table 1 ESTs identified by sample-sequencing of the ARSACS critical interval

BAC clone	GenBank #	UniGene	Identity*	Tissue Source
235_I,_20	AA987300	IIs. 129092	221/230	neuroendocrine lung carcinoids
235_I,_20	AA476635*		249/296	total fetus
235_I,_20	AI351876*		272/335	melanocyte, fetal heart, pregnant uterus (pool)
235_I,_20	W25994	IIs. 163732	447/464	retina
235_I,_20	AI377467	IIs. 163732	257/263	total fetus
235_I,_20	AA601007		488/491	schwannoma tumor
235_I,_20	AA324964		214/234	cerebellum
235_I,_20, 206_I,_I	AA897178[b]		238/238	fetal lung, testis, and B-cell
235_I,_20, 206_I,_I	RI7106[b]	IIs. 188560	747/784	brain, adipose tissue
235_I,_20, 206_I,_I	AB018273[b]	IIs. 159492	4318/4318	multiple tissue types including brain, CNS, and whole embryo

a: Number of homologous nucleotides between the BAC subclone sequence and the GenBank sequence.
b: AA897178, RI7106, and AB018273 are all contained within *spastin*.
*: AA176335 and AI351876 were homologous to non-overlapping portions of the same M13 subclone sequence.

Figure 6

App No.: 09/693,205
Title: Identification of ARSACS . . .
Inventors: Thomas J. Hudson, *et al.*

RECEIVED NOV 26 2002 TECH CENTER 1600/2900

APPROVED BY DRAFTSMAN | O.G. FIG. | CLASS | SUBCLASS

PATENT & TRADEMARK OFFICE NOV 21 2002 OIPE JC99

Table 2 Primers for PCR amplification of the human *spastin* ORF

Primer set	Forward primer	Reverse primer	Product size (bp)
1	(SEQ ID NO: 21) CCTTCCAGTACTGTGTTATTTGTGAG	CAAGAACTTCCTCAGGGCATC	(SEQ ID NO: 22) 603
2	(SEQ ID NO: 23) GATGCATCTATACAACATCCGCT	GGTGGGAAATAGGTTCCTTC	(SEQ ID NO: 24) 581
3	(SEQ ID NO: 25) AAAAATGAGAATCCAAATGTGCT	GCACTAAGGCTAGGTTTTGTGAAG	(SEQ ID NO: 26) 592
4	(SEQ ID NO: 27) GCTCCTCACTTCCTCTTGTTG	CGTGAATTGGCTTCATGATAA	(SEQ ID NO: 28) 602
5	(SEQ ID NO: 29) AGCAATCAGATTCCAGCAAGC	GATGGGAATGTCAGTGATATGG	(SEQ ID NO: 30) 611
6	(SEQ ID NO: 31) GGGAGAAGTTGACAAAGTTGGA	CTTTGGTTCATCACTGGGAAG	(SEQ ID NO: 32) 624
7	(SEQ ID NO: 33) TCCAAAGCATTGAACACACCT	CAGGTCCCGTAAGACACTCAG	(SEQ ID NO: 34) 631
8	(SEQ ID NO: 35) CAATGGGTGCTTTGCTGTTAC	CGAAGAACTCCCGAGAACTCA	(SEQ ID NO: 36) 620
9	(SEQ ID NO: 37) GCTGGCTGCAAACAGATACTAC	GCAAACATGGTTTCAGGCTTA	(SEQ ID NO: 38) 604
10	(SEQ ID NO: 39) CAAACAATCCGCTTCCTTCCAT	ATTATTCGTCGGCAAAGCTGA	(SEQ ID NO: 40) 651
11	(SEQ ID NO: 41) TTCCGCGAACTTTTTGAAACC	ACACAAAGTGCTGGCCCTTGC	(SEQ ID NO: 42) 625
12	(SEQ ID NO: 43) GATGCAAAGGCGACAGAAATC	ATACAGCACATTTAGAGCTCCAGT	(SEQ ID NO: 44) 626
13	(SEQ ID NO: 45) GCATCAGACAGAATGGTCCAG	GCAATTCAACATATGCAGGAG	(SEQ ID NO: 46) 624
14	(SEQ ID NO: 47) GTGAATGGCCACTTTGCACT	TGATATCAGCAGGGGTCACAT	(SEQ ID NO: 48) 648
15	(SEQ ID NO: 49) ACCACACGCAAAACAGTAGCA	GCCATGCATTCTTAAGCCAAG	(SEQ ID NO: 50) 609
16	(SEQ ID NO: 51) TGACATTTCCAGCTTTGCTGA	AGCGGCCACTGATGGATTTAT	(SEQ ID NO: 52) 631
17	(SEQ ID NO: 53) AAATGATTTTGAGGCACTTTTG	TTCCACCCAGGATGTCATAAA	(SEQ ID NO: 54) 609
18	(SEQ ID NO: 55) ACAGTAGACTAAAGCAAGCAAAGC	ATCAAGAGGAGGATCCAGGTT	(SEQ ID NO: 56) 645
19	(SEQ ID NO: 57) CATCCTGCCCTATTCTTCCAG	TAAAGCGCAAGGTCTCGTACA	(SEQ ID NO: 58) 618
20	(SEQ ID NO: 59) TGAGGGCAAACAATTAGATCC	TCTGCTGTGGGGAATAGGATT	(SEQ ID NO: 60) 612
21	(SEQ ID NO: 61) GCAAAGCCCTAAGAGAAGGATT	TGCTTTGAGAGCTTTCCTCAG	(SEQ ID NO: 62) 647
22	(SEQ ID NO: 63) TGAAAGAGAAGATGCTGACAATTC	GTAAGTCTGTCCGGCTGAAGG	(SEQ ID NO: 64) 654
23	(SEQ ID NO: 66) CATCCCGATTTCAGTCAGACA	TTCGTGCTACAACACATTCAAGA	(SEQ ID NO: 66) 638

Figure 7

RECEIVED NOV 26 2002 TECH CENTER 1600/2900

OIPE
NOV 21 2002
PATENT & TRADEMARK OFFICE
JC99

RECEIVED
NOV 26 2002
TECH CENTER 1600/2900

APPROVED BY DRAFTSMAN
O.G. FIG. CLASS SUBCLASS

```
LOCUS       AF193557    11493 bp    DNA             ROD
DEFINITION  Mus musculus sacsin gene, complete cds.
ACCESSION   AF193557
VERSION     AF193557.1  GI:6907043
KEYWORDS    .
SOURCE      house mouse.
  ORGANISM  Mus musculus
            Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
            Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
REFERENCE   1  (bases 1 to 11493)
  AUTHORS   Engert,J.C., Berube,P., Mercier,J., Dore,C., Lepage,P., Ge,B.,
            Bouchard,J.P., Mathieu,J., Melancon,S.B., Schalling,M.,
            Lander,E.S., Morgan,K., Hudson,T.J. and Richter,A.
  TITLE     ARSACS, a spastic ataxia common in northeastern Quebec, is caused
            by mutations in a new gene encoding an 11.5-kb ORF
  JOURNAL   Nat. Genet. 24 (2), 120-125 (2000)
  MEDLINE   20120709
REFERENCE   2  (bases 1 to 11493)
  AUTHORS   Engert,J.C., Berube,P., Dore,C., Lepage,P., Ge,B., Hudson,T.J. and
            Richter,A.
  TITLE     Direct Submission
  JOURNAL   Submitted (08-OCT-1999) Genome Centre, Montreal General Hospital,
            1650 Cedar Ave., Montreal, QC H3G 1A4, Canada
FEATURES             Location/Qualifiers
     source          1..11493
                     /organism="Mus musculus"
                     /db_xref="taxon:10090"
     mRNA            <1..>11493
                     /product="sacsin"
     CDS             1..11493
                     /note="molecular chaperone"
                     /codon_start=1
                     /product="sacsin"
                     /protein_id="AAF31263.1"
                     /db_xref="GI:6907044"

/translation="MNTFWPGRELVVQWYPFSEDKRHPSLSWLKMVWKNLYIHFSEDL
TLFDEMPLIPRTLLNEDQTCVELIRLRIPSVVILDDETEAQLPEFLADIVQKLGGIVL
KRLDTSIQHPLVKKYIHSPLPSAILQIMEKIPLQKLCNQIASLLPTHKDALRKFLASL
TDTSEKEKRIIQELTIFKRINHSSDQGISSYTKLKGCKVLDHTAKLPTDLRLSVSVID
SSDEATIRLANMLKIEKLKTTSCLKFVLKDIGNAFYTQEEVTQLMLWILENLSSLKNE
NSNVLDWLMPLKFIHMSQGHVVAAGDLFDPDIEVLRDLFYNEEEACFPPTIFTSPDIL
HSLRQIGLKNESSLKEKDVVQVARKIEALQVSSCQNQDVLMKKAKTLLLVLNKNQTLL
QSSEGKMALKKIKWVPACKERPPNYPGSLVWKGDLCNLCAPPDMCDAAHAVLVGSSLP
LVESVHVNLEQALSIFTKPTINAVLKHFKTVVDWYTSKTFSDEDYYQFQHILLEIYGF
MHDHLSEGKDSFKALKFPWVWTGKNFCPLAQAVIKPTHDLDLQPYLYNVPKTMAKFHQ
LFKACGSIEELTSDHISMVIQKVYLKSDQELSEEESKQNLHLMLNIMRWLYSNQIPAS
```

Figure 8A

OIPE
NOV 21 2002
PATENT & TRADEMARK OFFICE
JC69

RECEIVED
NOV 26 2002
TECH CENTER 1600/2900

O.G. FIG.
CLASS
SUBCLASS
APPROVED BY DRAFTSMAN

PNTPVPIYHSRNPSKLVMKPIHECCYCDIKVDDLNDLLEDSVEPIILVHEDIPMKTAE
WLKVPCLSTRLINPENMGFEQSGQREPLTVRIKNILEEYPSVSDIFKELLQNADDANA
TECSFMIDMRRNMDIRENLLDPGMAACHGPALWSFNNSEFSDSDFLNITRLGESLKRG
EVDKVGKFGLGFNSVYHITDIPIIMSREFMIMFDPNININHISKHIKDRSNPGIKINWSK
QQKRLRKFPNQFKPFIDVFGCQLPLAVEAPYSYNGTLFRLSFRTQQEAKVSEVSSTCY
NTADIYSLVDEFSLCGHRLIIFTQSVNSMYLKYLKIEETNPSLAQDTIIIKKKVCPSK
ALNAPVLSVLKEAAKLMKTCSSSNKKLPTDVPKSSCILQITVEEFHHVFRRIADLQSP
LFRGPDDDPATLFEMAKSGQSKKPSDELPQKTVDCTTWLICTCMDTGEALKFSLNESG
RRLGLVPCGAVGVLLHETQEQKWTVKPHIGEVFCYLPLRIKTGLPIHINGCFAVTSNR
KEIWKTDTKGRWNTTFMRHVIVKAYLQALSVLRDLAIGGELTDYTYYAVWPDPDLVHD
DFSVICKGFYEDIAHGKGKELTRVFSDGSMWVSMKNVRFLDDSILQRKDVGSAAFKIF
LKYLKKTGSKNLCAVELPSSVKAGFEEAGCKQILLENTFSEKQFFSEVFFPNIQEIEA
ELRDPLMNFVLNEKLDEFSGILRVTPCVPCSLEGHPLVLPSRLIHPEGRVAKLFDTKD
GRFPYGSTQDYLNPIILIKLVQLGMAKDDILWDDMLERAESVAEINKSDHAAACLRSS
ILLSLIDEKLKIKDPRAKDFAAKYQTIPFLPFLTKPAGFSLEWKGNSFKPETMFAATD
IYTAEYQDIVCLLQPILNENSHSFRGCGSVSLAVKEFLGLLKKPTVDLVINQLKQVAK
SVDDGITLYQENITNACYKYLHEAVLQNEMAKATIIEKLKPFCFILVENVYVESEKVS
FHLNFEAAPYLYQLPNKYKNNFRELFESVGVRQSFTVEDFALVLESIDQERGKKQITE
ENFQLCRRIISEGIWSLIREKRQEFCEKNYGKILLPDTNLLLLPAKSLCYNDCPWIKV
KDSTVKYCHADIPREVAVKLGAIPKRHKALERYASNICFTALGTEFGQKEKLTSRIKS
ILNAYPSEKEMLKELLQNADDAKATEICFVFDPRQHPVDRIFDDKWAPLQGPALCVYN
NQPFTEDDVRGIQNLGKGTKEGNPCKTGHYGIGFNSVYHITDCPSFISGNDILGIFDP
HARYAPGATSVSPGRMFRDLDADFRTQFSDVLDLYLGNHFKLDNCTMFRFPLRNAEMA
QVSEISSVPSSDRMVQNLLDKLRSDGAELLMFLNHMEKISICEIDKATGGLNVLYSVK
GKITDGDRLKRKQFHASVIDSVTKKRQLKDIPVQQITYTMDTEDSEGNLTTWLICNRS
GFSSMEKVSKSVISAHKNQDITLFPRGGVAACITHNYKKPHRAFCFLPLSLETGLPFH
VNGHFALDSARRNLWRDDNGVGVRSDWNNSLMTALIAPAYVELLIQLKKRYFPGSDPT
LSVLQNTPIHVVKDTLKKFLSFFPVNRLDLQPDLYCLVKALYSCIHEDMKRLLPVVRA

Figure 8B

OIPE JC99 NOV 21 2002 PATENT & TRADEMARK OFFICE

RECEIVED
NOV 26 2002
TECH CENTER 1600/2900

O.G. FIG. CLASS SUBCLASS APPROVED BY DRAFTSMAN

PNIDGSDLHSAVIITWINMSTSNKTRPFFDNLLQDELQHLKNADYNITTRKTVAENVY
RLKHLLLEIGFNLVYNCDETANLYHCLVDADIPVSYVTPADVRSFLMTFSSPDTNCHI
GKLPCRLQQTNLKLFHSLKLLVDYCFKDAEESEFEVEGLPLLITLDSVLQIFDGKRPK
FLTTYHELIPSRKDLFMNTLYLKYSSVLLNCKVAKVFDISSFADLLSSVLPREYKTKN
CAKWKDNFASESWLKNAWHFISESVSVTDDQEEPKPAFDVIVDILKDWALLPGTKFTV
STSQLVVPEGDVLIPLSLMHIAVFPNAQSDKVFHALMKAGCIQLALNKICSKDSALVP
LLSCHTANIDSPASILKAVHYMVQTSTFRTEKLMENDFEALLMYFNCNLSHLMSQDDI
KILKSLPCYKSISGRYMSIAKFGTCYVLTKSIPSAEVEKWTQSSSSAFLEEKVHLKEL
YEVLGCVPVDDLEVYLKHLLPKIENLSYDAKLEHLIYLKNRLASIEEPSEIKEQLFEK
LESLLIIHDANNRLKQAKHFYDRTVRVFEVMLPEKLFIPKEFFKKLEQVIKPKNQAAF
MTSWVEFLRNIGLKYALSQQQLLQFAKEISVRANTENWSKETLQSTVDILLHHIFQER
MDLLSGNFLKELSLIPFLCPERAPAEYIRFHPQYQEVNGTLPLIKFNGAQVNPKFKQC
DVLQLLWTSCPILPEKATPLSIKEQEGSDLAPQEQLEQVLNMLNVNLDPPLDKVINNC
RNICNITTLDEEMVKTRAKVLRSIYEFLSAEKREFRFQLRGVAFVMVEDGWKLLKPEE
VVINLEYEADFKPYLYKLPLELGTFHQLFKHLGTEDIISTKQYVEVLSRIFKSSEGKQ
LDPNEMRTVKRVVSGLFKSLQNDSVKVRSDLENARDLALYLPSQDGKLVKSSILVFDD
APHYKSRIQGNIGVQMLVDLSQCYLGKDHGFHTKLIMLFPQKLRPRLLSSILEEQLDE
ETPKVCQFGALCSLQGRLQLLLSSEQFITGLIRIMKHENDNAFLANEEKAIRLCKALR
EGLKVSCFEKLQTTLRVKGFNPIPHSRSETFAFLKRFGNAVILLYIQHSDSKDINFLL
ALAMTLKSATDNLISDTSYLIAMLGCNDIYRISEKLDSLGVKYDSSEPSKLELPMPGT
PIPAEIHYTLLMDPMNVFYPGEYVGYLVDAEGGDIYGSYQPTYTYAIIVQEVEREDAD
NTSFLGKIYQIDIGYSEYKIVSSLDLYKFSRPDESSQNRDSAPTTPTSPTEFLTPGLR
SIPPLFSGKESHKSPSTKHHSPRKLKVNALPEILKEVTSVVEQAWKLPESERKKIIRR
LYLKWHPDKNPENHDIANEVFKHLQNEINRLEKQAFLDQNADRASRRTFSTSASRFQS
DKYSFQRFYTSWNQEATSHKSERQQQSKEKCPPSAGQTYSQRFFVPPTFKSVGNPVEA
RRWLRQARANFSAARNDLHKNANEWVCFKCYLSTKLALIAADYAVRGKSDKDVKPTAL
AQKIEEYSQQLEGLTNDVHTLEAYGVDSLKTRYPDLLPFPQIPNDRFTSEVAMRVMEC
TACIIIKLENFIQQKV"

Figure 8C

OIPE
NOV 21 2002
PATENT & TRADEMARK OFFICE
JC99

RECEIVED
NOV 26 2002
TECH CENTER 1600/2900

APPROVED BY DRAFTSMAN | O.G. FIG. CLASS | SUBCLASS

BASE COUNT 3599 a 2281 c 2387 g 3226 t
ORIGIN

```
   1 atgaatacat tctggcctgg tcgagagttg gtggttcagt ggtatccatt tagtgaagac
  61 aaacgtcacc catccctttc atggcttaag atggtttgga agaatctcta tatacatttc
 121 tcggaagatt tgactttatt tgatgagatg ccacttatcc ctagaactct actgaatgag
 181 gaccagacgt gtgtggaact catcagactc aggatcccat cagtagtcat tttagatgat
 241 gaaactgaag ctcagcttcc agaattctta gcagatattg tacaaaaact tggagggatt
 301 gtcctgaaaa gactagatac ctctattcag catccacttg ttaaaaaata cattcattcc
 361 ccactcccga gtgctatttt gcagataatg gagaagatac ctctacagaa gttgtgtaat
 421 caaatagcat cattacttcc aacccacaaa gatgctctaa ggaagttttt ggccagctta
 481 actgatacca gtgaaaaaga gaaaagaata attcaagaat tgacaatatt caaaagaatt
 541 aatcactcat cagatcaagg gatttcctct tacacaaaat taaaaggatg taaagttttg
 601 gatcataccg ccaagcttcc aacagatcta cggctatcag tttcagtaat agatagtagt
 661 gatgaagcca ccattcgttt ggcaaacatg ttgaaaattg aaaaattgaa gactacaagc
 721 tgtttaaagt ttgttttaaa agatattgga aatgcatttt atacacagga agaggtaaca
 781 caacttatgc tttggatcct tgagaatcta tcctctctta aaaatgagaa ttcaaatgtg
 841 cttgattggt taatgccact aaaattcatt catatgtccc agggacatgt ggtagcagct
 901 ggtgatctct ttgatcctga tatagaagta ctaagggatc tcttttataa tgaagaagaa
 961 gcttgtttcc cacctacaat ttttacctca ccagatatcc ttcactcttt gagacagatt
1021 ggcttaaaaa atgaatccag tctaaaagaa aaagatgttg tacaagtggc aagaaaaatt
1081 gaagctttac aggtcagttc ctgtcagaat caggatgttc tcatgaagaa agccaaaaca
1141 ctcttactgg tcttgaataa aaaccagaca ctcttgcagt cttctgaagg gaagatggca
1201 ttgaagaaaa tcaaatgggt tccagcctgc aaggaaagac ctccaaatta tcccggttcc
1261 ttagtctgga aaggggatct ctgtaatctt tgtgcacctc cagatatgtg tgatgcggca
1321 catgcagttc tagtaggctc ctcacttcct cttgttgaaa gtgtccatgt gaacctggag
1381 caggcgctca gcatcttcac aaagcctact atcaatgctg tcttaaaaca ctttaaaact
1441 gttgttgact ggtatacttc aaaaaccttt agtgatgaag attactatca gttccaacat
1501 attttgcttg aaatttatgg gttcatgcat gatcatctga gtgaagggaa ggattctttt
1561 aaagccttga agtttccatg ggtttggact ggcaaaaact tttgtcctct tgcccaggct
1621 gtgataaagc caacccatga tctggatctt cagccttatt tatataatgt gcctaaaacc
1681 atggcaaaat tccaccagct gttcaaggct tgtggctcaa tagaagagtt gacatcagat
1741 catatttcca tggtcattca gaaagtttat ctcaaaagtg accaggagtt gagtgaagaa
1801 gaaagtaaac aaaatcttca tctcatgttg aatattatga gatggctcta tagcaatcag
1861 attccagcaa gccctaatac accagttcct atttatcaca gcagaaatcc ttccaaactt
1921 gtcatgaagc caattcatga atgctgttat tgtgacatca aagttgatga cctcaatgac
1981 ttgcttgaag attcagtgga accaattatc ttggtacatg aagatatacc catgaaaact
2041 gcagaatggc taaaagttcc gtgccttagt acaagactga tcaatcctga aaacatgggg
2101 tttgagcagt cagggcaaag agagcctctt actgtaagga ttaaaaatat tttggaagaa
2161 taccttccg tgtcagatat ttttaaagag ctacttcaaa atgctgatga tgcaaatgcc
2221 acagaatgca gcttcatgat tgatatgaga aggaatatgg acatacggga aaatctcctg
2281 gacccaggga tggcagcttg tcatggacct gctctgtggt cattcaacaa ttctgaattc
2341 tcagattcag atttcttaaa cataacgagg ttaggagagt ctttaaaaag gggagaagtt
2401 gacaaggttg ggaaatttgg tcttggtttt aattctgtgt accacatcac tgacattccc
2461 atcattatga gcagagaatt tatgataatg tttgatccaa acataaatca tatcagcaaa
2521 cacattaaag atagatcgaa tcctggaatc aaaattaatt ggagtaagca gcagaaaaga
2581 cttaggaagt tccccaacca gttcaaacca tttatagatg tatttggctg tcagttacct
2641 ttggctgttg aagctcctta cagctacaat ggaactcttt tccgactgtc ctttagaaca
2701 cagcaggaag caaaagtgag tgaagttagc agtacttgct acaatactgc ggatatttac
2761 tccctagtgg atgaatttag tctttgtggg cacagactta tcatttttac tcagagtgta
2821 aactcgatgt atttgaaata cttgaaaatt gaagaaacca atcctagctt agcacaagat
2881 acaatcataa ttaagaaaaa agtttgcccc tccaaagcat tgaatgcacc agttttaagt
2941 gttttaaaag aagctgctaa actcatgaag acttgtagca gcagcaacaa gaagcttccc
3001 acggatgtgc caaagtcatc ttgcattctt cagatcacag tcgaagaatt ccaccatgtg
3061 tttaggagga ttgctgactt acagtcacca ctatttcgag gtccagatga tgacccagct
3121 actctctttg aaatggctaa atctggccaa tcaaaaaagc catcagatga gttgccacaa
3181 aagacagtag attgtaccac atggcttata tgcacatgca tggatacagg agaagctctc
3241 aagttttcct tgaatgaaag tggaagaaga ttagggctgg ttccttgtgg ggcagtaggg
```

Figure 8D

OIPE
NOV 21 2002
PATENT & TRADEMARK OFFICE
JC99

RECEIVED
NOV 26 2002
TECH CENTER 1600/2900

APPROVED BY DRAFTSMAN | O.G. FIG. | CLASS | SUBCLASS

```
3301 gttctcttgc atgaaaccca ggaacagaag tggaccgtga aaccacacat aggagaagtg
3361 ttttgctatt tacctctacg aatcaaaaca gggttgccaa ttcacatcaa tgggtgcttt
3421 gctgttactt caaataggaa agaaatctgg aagacagata caaaaggtcg atggaatacc
3481 acattcatga ggcatgtcat tgtgaaagct tacttacaag ccctcagtgt cttacgggac
3541 ctagccattg gtggtgagct gactgattat acttactatg cagtgtggcc tgatcctgat
3601 ctagttcatg atgacttctc tgtgatctgt aaaggatttt atgaagacat tgctcatggg
3661 aaggggaagg agttgaccag agtcttctct gatgggtcta tgtgggtttc catgaagaat
3721 gtgaggtttc tggatgactc tatacttcaa aggaaagatg ttggttcagc agccttcaag
3781 atatttctga agtacctcaa gaaaacagga tccaaaaacc tctgtgctgt tgagcttcct
3841 tcttcagtaa aagcaggatt tgaagaggct ggctgtaaac agatactgct ggaaaataca
3901 ttttcagaga aacagttctt ttcagaagtc ttctttccta atatccagga aattgaagca
3961 gaacttagag atcctctgat gaattttgtc ctaaatgaaa aacttgatga gttctcagga
4021 attcttcgtg ttacccctg tgttccttgc tccttggagg gccatccttt ggttttgcct
4081 tcaagattga tccatcctga aggacgagtt gcaaagttat ttgatactaa agatggaaga
4141 ttcccttatg gttccacaca ggattacctc aatcctatta tcttgattaa gctcgttcag
4201 ttaggcatgg caaaagatga tattttgtgg gatgacatgc tagagcgtgc agagtctgta
4261 gctgagatta ataaaagtga ccatgctgct gcctgcttaa ggagtagtat tctgctaagc
4321 cttattgatg agaagctaaa aataaaggat cctagagcaa aggattttgc tgcaaaatat
4381 caaacaattc ccttcctccc atttctaaca aagccagcag gtttttcttt agaatggaaa
4441 gggaacagct ttaagcctga aaccatgttt gcagcaactg acatttacac agctgaatat
4501 caagatatag tctgtctttt gcaaccaatt cttaatgaaa attcccattc ctttagaggc
4561 tgtggttcag tgtctttggc tgttaaggag tttttgggtt tactaaagaa gccaacagtt
4621 gatctggtaa taaaccagtt gaagcaagtt gcaaaatcag ttgatgatgg cattacattg
4681 taccaggaaa atatcaccaa cgcttgctac aaatacctcc atgaagcagt attgcagaat
4741 gaaatggcca aggcaacaat tattgagaag ctaaagccat tttgtttcat tctagttgag
4801 aatgtatatg ttgagtcaga aaaggtttct tttcacttga actttgaagc agcaccatac
4861 ctttatcagt tacctaacaa gtataaaaat aatttccgtg agctttttga aagtgtgggt
4921 gtgcgacagt catttactgt tgaagacttt gccctagttt tggagtctat tgatcaagag
4981 agaggaaaaa aacaaataac agaagagaat tttcagcttt gccgacgaat aatcagtgaa
5041 ggcatctgga gtctcattag agaaaagaga caagaatttt gtgagaaaaa ttatggcaaa
5101 atattactgc cagacactaa cctgctgctg ctccctgcta agtcattatg ctacaatgac
5161 tgtccctgga taaaagtaaa ggactccact gtcaagtatt gccatgccga catacccggg
5221 gaagtagctg taaaacttgg tgcaatacca aagagacata aagcattaga aagatatgca
5281 tccaacatct gtttcacagc tctaggtaca gaatttgggc agaaagaaaa actgaccagc
5341 agaattaaga gcattctcaa tgcctatcct tcagaaaagg aaatgctgaa agagcttctt
5401 caaaatgctg atgatgcaaa ggccacagag atctgctttg tgtttgatcc tagacagcat
5461 cctgttgacc gaatatttga tgataagtgg gccccactgc aagggccagc actgtgtgtt
5521 tacaacaacc agccatttac agaagatgat gttagaggaa ttcagaatct tgggaaaggc
5581 accaaagaag ggaatccttg caaaacagga cattatggaa tcggattcaa ttccgtttat
5641 catattacag actgcccttc ttttatttct ggcaatgaca tcctgggtat ttttgatccc
5701 catgccagat atgcaccagg agccacatca gttagccctg gacgcatgtt tagagatttg
5761 gatgcagact ttagaaccca gttctcagat gttctagatc tgtacttggg aaaccacttt
5821 aaactggaca attgtacaat gtttagattt cctctgcgta atgcagagat ggcacaagtt
5881 tcagaaattt cttccgttcc atcatcagac agaatggtcc agaatctttt ggacaagtta
5941 cggtctgatg gggcagaact tctaatgttt ctcaaccaca tggagaaaat atctatttgt
6001 gaaatagata aggccacagg aggtctgaat gtgctctatt cagtaaaagg caagatcact
6061 gatggagacc gattgaaaag gaagcaattc cacgcctctg taattgacag tgttactaaa
6121 aagagacagc tcaaggacat accagttcaa caaataacct acactatgga tactgaggat
6181 tctgaaggaa atctgaccac atggctcatc tgtaatagat caggattttc aagtatggaa
6241 aaagtatcca agagtgtaat atcagctcac aagaaccaag atatcaccct tttcccacgt
6301 ggtggagtag cagcctgcat tactcacaat tataaaaagc cccacagagc cttctgcttt
6361 ctgcctctct ctttggagac agggctgcca tttcatgtga atggccactt tgctctagat
6421 tcagccagaa gaaacttgtg gcgtgatgat aatggggttg gtgttcgaag tgactggaat
6481 aatagtttaa tgacagcatt aatagcacct gcatatgttg agttactaat ccagttaaaa
6541 aaacggtatt tccctggttc tgacccaaca ttatcagttt tacagaacac acccattcat
6601 gtcgtaaagg acacattaaa gaagtttctg tccttctttc cagttaacag gctggatctg
6661 cagccggact tatattgctt agtaaaagca ctttacagtt gcattcatga agacatgaag
```

Figure 8E

OIPE
NOV 21 2002
PATENT & TRADEMARK OFFICE
JC99

RECEIVED
NOV 26 2002
TECH CENTER 1600/2900

APPROVED BY DRAFTSMAN | O.G. FIG. | CLASS | SUBCLASS

```
 6721 cgtcttttgc ctgttgttcg ggctccaaat attgatggct cagatttgca ctctgcagtc
 6781 ataattactt ggatcaatat gtctacttca aataaaacta gaccattttt tgataactta
 6841 ctacaggatg aattacagca ccttaaaaat gcagattata acatcacaac tcgaaaaaca
 6901 gtcgcagaga atgtctacag actgaagcac ctgctcttag aaattggttt caacttggtt
 6961 tataactgtg atgaaactgc taacctttac cattgccttg tagatgcaga tatccctgtc
 7021 agctatgtga ctcctgctga tgttaggtcc ttcttaatga ctttctcttc tcctgacact
 7081 aattgccata ttgggaagct gccttgtcgt cttcagcaga ctaacctaaa acttttcac
 7141 agtttaaaac ttttagttga ttactgtttt aaagatgctg aagaaagtga gtttgaagtt
 7201 gagggactgc ccctactcat tacactggac agtgtcttgc agatttttga tggtaaacga
 7261 cccaagtttc taacaacata ccatgaatta attccatcgc gtaaagactt gtttatgaac
 7321 accttatact tgaaatacag tagtgttttg ttgaactgca aagttgcaaa agtgtttgac
 7381 atttccagct ttgctgactt actctcttct gtgttgcctc gtgagtacaa gaccaaaaac
 7441 tgtgcaaagt ggaaagacaa ttttgccagt gaatcttggc ttaagaacgc atggcatttt
 7501 atcagtgaat cagtaagtgt aacggatgat caggaagaac caaagccagc atttgatgtc
 7561 attgttgaca tccttaaaga ctgggcattg cttccaggaa caaagttcac tgtgtcaacc
 7621 agtcagcttg tggttcctga gggagacgtg ttgattcccc tgagcctcat gcacattgct
 7681 gtgttcccaa atgctcagag tgataaggtt tttcacgctc tgatgaaagc tggctgtatt
 7741 cagctggctt tgaacaaaat ctgctctaaa gacagcgcat tagttcctct gttgtcatgc
 7801 cacacagcaa acatagatag ccctgcaagc atcttgaagg ctgtgcatta tatggttcag
 7861 acgtcaacat ttagaactga aaaactaatg gaaaatgact ttgaagcact tttgatgtat
 7921 ttcaactgta atttgagtca cttgatgtcc caagatgaca taaaaatttt aaagtccctc
 7981 ccatgctaca aatccatcag tggccgctat atgagcattg caaaatttgg aacgtgctat
 8041 gtgcttacca aaagtattcc ttcagctgaa gtggaaaaat ggacacagtc atcctcttcc
 8101 gcgtttcttg aagaaaaggt gcatttaaaa gaactctatg aggtgcttgg ctgtgtgcca
 8161 gtagatgatc tggaggtgta tttgaaacat cttctgccaa aaattgaaaa tctctcttat
 8221 gatgcaaagt tggagcacct gatttatctg aagaatagac tggcaagcat cgaggaaccg
 8281 tcagagatta aggagcaact ttttgaaaaa ctggaaagct tattgattat ccacgatgcc
 8341 aacaatcgac taaagcaagc aaaacatttc tatgacagaa ctgtgagagt ttttgaagtt
 8401 atgcttcctg aaaaattgtt tattcctaag gagttcttta aaaaattgga acaagtaatc
 8461 aaacctaaaa atcaagctgc atttatgacg tcctgggtgg aattcttgag aaatattgga
 8521 ctgaagtacg cgctctccca gcagcagttg ttacagtttg ccaaggaaat cagtgtgagg
 8581 gcaaatacag aaaactggtc taaagaaacc ctgcaaagta cagttgacat ccttctccat
 8641 cacatattcc aagaacgaat ggatttgtta tctggaaatt ttctgaaaga actgtcctta
 8701 ataccattct tgtgtcctga acgggccccc gctgagtaca ttcggtttca ccctcagtac
 8761 caggaggtaa acggaacact tcctcttata aagttcaatg gagcacaagt gaatccaaag
 8821 ttcaagcaat gtgatgtact ccagctgctg tggacatctt gccctattct tccagagaaa
 8881 gccacaccgt tgagcattaa agaacaagaa ggcagtgacc tcgctccaca ggaacagctt
 8941 gaacaagttt taaatatgct taatgttaac ctggacccca ctcttgataa ggtcattaat
 9001 aattgcagaa acatatgcaa cataacaact ttggatgagg aaatggtaaa aactagagca
 9061 aaggtcctaa ggagcatata tgaatttctg agtgcagaaa aacgagagtt ccgttttcag
 9121 cttcggggtg tggcctttgt aatggtagaa gacggatgga aacttctgaa gcctgaggaa
 9181 gtagtgataa acctggagta tgaggctgat tttaaacctt atctgtacaa gctgccttta
 9241 gagcttggca cttttcatca gctgttcaaa catttaggta ctgaagatat catttccact
 9301 aagcaatatg ttgaagtgtt aagccgaata ttcaaaagct ctgaaggaaa gcagctagac
 9361 cctaatgaaa tgcgtacagt taagagagtg gtttctggcc tattcaagag tctacaaaat
 9421 gattcagtca aggtgaggag tgacctggag aatgcccggg acctcgcact ctaccttcca
 9481 agccaggatg ggaagttggt gaagtcaagc atcttggtgt tcgatgatgc gccacattat
 9541 aaaagtagga tccaggggaa tattggcgtg cagatgctag ttgatcttag ccagtgctac
 9601 ttagggaaag accatggatt tcacactaag ctgataatgc tctttcctca aaagcttcga
 9661 cctcgtctgc tgagcagtat acttgaagag cagcttgatg aggagacccc taaagtgtgc
 9721 cagtttggcg cattgtgctc tcttcaggga agactgcagc ttctcttgtc ttcagagcag
 9781 ttcatcacag gactcattcg aatcatgaag catgaaaatg ataatgcttt cctggccaat
 9841 gaagaaaaag ccataagact ttgcaaagct ctaagagaag ggctgaaagt ttcctgtttt
 9901 gagaagcttc agacaacatt aagggttaaa ggttttaatc ctattcccca tagcaggagt
 9961 gaaactttcg cttttctaaa gcgatttggc aatgcagtca tcttgctcta catccaacat
10021 tcagacagca aagacattaa ctttctgcta gccttagcga tgacacttaa atcagcaact
10081 gacaatttga tttctgacac gtcatactta attgctatgc tgggatgcaa tgacatttac
```

Figure 8F

OIPE
NOV 21 2002
PATENT & TRADEMARK OFFICE
JC99

RECEIVED
NOV 26 2002
TECH CENTER 1600/2900

APPROVED BY DRAFTSMAN | O.G. FIG. CLASS SUBCLASS

```
10141 aggatcagtg agaagcttga cagtttaggg gtgaaatacg actcctctga gccatcaaaa
10201 ctggaactcc ccatgcctgg cacaccaata cccgctgaga tccattacac actacttatg
10261 gatccaatga atgtttttta tcctggggaa tatgttggtt accttgtgga tgctgaaggt
10321 ggtgatatct atgggtcata ccagccaaca tacacatacg caattattgt gcaagaagtt
10381 gaaagagaag atgctgacaa tactagtttc ttaggaaaga tctatcagat cgatattggc
10441 tacagtgaat ataagatagt cagctctctt gatctgtaca agttctcaag gcctgatgaa
10501 agctcccaaa acagagacag tgctcccacc acaccaacaa gccccaccga attcctgact
10561 cctggtctga gaagcatccc tcctcttttc tctggcaagg agagccacaa gtctccctcc
10621 accaaacacc attcccccag aaagctcaag gtgaatgctt taccagaaat cttaaaagaa
10681 gtgacatcag tggtggagca agcttggaag cttccagaat cagagcggaa aaagatcatt
10741 agacgcttgt atttgaagtg gcaccctgac aaaaatccag aaaatcatga tattgctaat
10801 gaagtgttca agcacctgca gaatgaaatc aacagattag aaaaacaggc ttttctggat
10861 caaaatgcag acagagcttc aagaagaaca ttttcaacct ctgcatctcg atttcagtca
10921 gacaagtact catttcaaag attttacact tcgtggaatc aagaagccac aagtcataaa
10981 tctgaaaggc aacagcaaag caaagagaaa tgccctcctt ctgctggaca gacatactct
11041 caaaggttct ttgttcctcc caccttcaag tcagtgggca atccagtgga agcccggaga
11101 tggttaagac aagccagagc aaacttctca gctgccagga atgaccttca caaaaatgcc
11161 aatgaatggg tgtgcttcaa gtgttacctt tccaccaagc tggctttgat tgcagccgac
11221 tatgctgtca gggggaaatc tgataaagat gtaaagccaa ctgcacttgc acaaaagata
11281 gaggagtaca gtcagcagct ggaaggactg acaaacgatg tgcacacatt ggaagcttat
11341 ggtgtagaca gcttgaaaac aaggtaccct gatttgcttc cttttccgca gattcccaat
11401 gacaggttca catctgaggt tgccatgagg gtgatggaat gcactgcctg tatcatcata
11461 aaacttgaaa attttataca acagaaggtg tga
//
```

Figure 8G

OIPE
NOV 21 2002
PATENT & TRADEMARK OFFICE 1600

RECEIVED
NOV 26 2002
TECH CENTER 1600/2900

APPROVED BY DRAFTSMAN
O.G. FIG. CLASS SUBCLASS

LOCUS AF193556 12793 bp DNA PRI 07-FEB-2000
DEFINITION Homo sapiens sacsin (SACS) gene, complete cds.
ACCESSION AF193556 VERSION AF193556.1 GI:6907041KEYWORDS .
SOURCE human.
ORGANISM Homo sapiens Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.

REFERENCE 1 (bases 1 to 12793) AUTHORS Engert,J.C., Berube,P., Mercier,J., Dore,C., Lepage,P., Ge,B., Bouchard,J.P., Mathieu,J., Melancon,S.B., Schalling,M., Lander,E.S., Morgan,K., Hudson,T.J. and Richter,A. TITLE ARSACS, a spastic ataxia common in northeastern Quebec, is caused by mutations in a new gene encoding an 11.5-kb ORF JOURNAL Nat. Genet. 24 (2), 120-125 (2000) MEDLINE 20120709

REFERENCE 2 (bases 1 to 12793) AUTHORS Engert,J.C., Berube,P., Dore,C., Lepage,P., Ge,B., Hudson,T.J. and Richter,A. TITLE Direct Submission JOURNAL Submitted (08-OCT-1999) Genome Centre, Montreal General Hospital, 1650 Cedar Ave., Montreal, QC H3G 1A4, CanadaFEATURES Location/Qualifiers source 1..12793 /organism="Homo sapiens" /db_xref="taxon:9606" /chromosome="13" /map="between D13S232 and D13S292" mRNA 1..12793 /gene="SACS" /product="sacsin" gene 1..12793 /gene="SACS" CDS 77..11566 /gene="SACS" /note="molecular chaperone" /codon_start=1 /product="sacsin" /protein_id="AAF31262.1" /db_xref="GI:6907042" /translation="

MNTFWPGRELIVQWYPFDENRNHPSVSWLKMVWKNLYIHFSEDL
TLFDEMPLIPRTILEEGQTCVELIRLRIPSLVILDDESEAQLPEFLADIVQKLGGFVL
KKLDASIQHPLIKKYIHSPLPSAVLQIMEKMPLQKLCNQITSLLPTHKDALRKFLASL
TDSSEKEKRIIQELAIFKRINHSSDQGISSYTKLKGCKVLHHTAKLPADLRLSISVID
SSDEATIRLANMLKIEQLKTTSCLKLVLKDIENAFYSHEEVTQLMLWVLENLSSLKNE
NPNVLEWLTPLKFIQISQEQMVSAGELFDPDIEVLKDLFCNEEGTYFPPSVFTSPDIL
HSLRQIGLKNEASLKEKDVVQVAKKIEALQVGACPDQDVLLKKAKTLLLVLNKNHTLL
QSSEGKMTLKKIKWVPACKERPPNYPGSLVWKGDLCNLCAPPDMCDVGHAILIGSSLP
LVESIHVNLEKALGIFTKPSLSAVLKHFKIVVDWYSSKTFSDEDYYQFQHILLEIYGF
MHDHLNEGKDSFRALKFPWVWTGKKFCPLAQAVIKPIHDLDLQPYLHNVPKTMAKFHQ
LFKVCGSIEELTSDHISMVIQKIYLKSDQDLSEQESKQNLHLMLNIIRWLYSNQIPAS
PNTPVPIHHSKNPSKLIMKPIHECCYCDIKVDDLNDLLEDSVEPIILVHEDIPMKTAE
WLKVPCLSTRLINPENMGFEQSGQREPLTVRIKNILEEYPSVSDIFKELLQNADDANA
TECSFLIDMRRNMDIRENLLDPGMAACHGPALWSFNNSQFSDSDFVNITRLGESLKRG
EVDKVGKFGLGFNSVYHITDIPIIMSREFMIMFDPNINHISKHIKDKSNPGIKINWSK
QQKRLRKFPNQFKPFIDVFGCQLPLTVEAPYSYNGTLFRLSFRTQQEAKVSEVSSTCY
NTADIYSLVDEFSLCGHRLIIFTQSVKSMYLKYLKIEETNPSLAQDTVIIKKKSCSSK
ALNTPVLSVLKEAAKLMKTCSSSNKKLPSDEPKSSCILQITVEEFHHVFRRIADLQSP
LFRGPDDDPAALFEMAKSGQSKKPSDELSQKTVECTTWLLCTCMDTGEALKFSLSESG
RRLGLVPCGAVGVQLSEIQDQKWTVKPHIGEVFCYLPLRIKTGLPVHINGCFAVTSNR
KEIWKTDTKGRWNTTFMRHVIVKAYLQVLSVLRDLATSGELMDYTYYAVWPDPDLVHD
DFSVICQGFYEDIAHGKGKELTKVFSDGSTWVSMKNVRFLDDSILKRRDVGSAAFKIF
LKYLKKTGSKNLCAVELPSSVKLGFEEAGCKQILLENTFSEKQFFSEVFFPNIQEIEA
ELRDPLMIFVLNEKVDEFSGVLRVTPCIPCSLEGHPLVLPSRLIHPEGRVAKLFDIKD
GRFPYGSTQDYLNPIILIKLVQLGMAKDDILWDDMLERAVSVAEINKSDHVAACLRSS
ILLSLIDEKLKIRDPRAKDFAAKYQTIRFLPFLTKPAGFSLDWKGNSFKPETMFAATD
LYTAEHQDIVCLLQPILNENSHSFRGCGSVSLAVKEFLGLLKKPTVDLVINQLKEVAK
SVDDGITLYQENITNACYKYLHEALMQNEITKMSIIDKLKPFSFILVENAYVDSEKVS
FHLNFEAAPYLYQLPNKYKNNFRELFETVGVRQSCTVEDFALVLESIDQERGTKQITE
ENFQLCRRIISEGIWSLIREKKQEFCEKNYGKILLPDTNLMLLPAKSLCYNDCPWIKV

Figure 9A

OIPE
NOV 21 2002
PATENT & TRADEMARK OFFICE

RECEIVED
NOV 26 2002
TECH CENTER 1600/2900

O.G. FIG.
APPROVED BY DRAFTSMAN
CLASS
SUBCLASS

KDTTVKYCHADIPREVAVKLGAVPKRHKALERYASNVCFTTLGTEFGQKEKLTSRIKS
ILNAYPSEKEMLKELLQNADDAKATEICFVFDPRQHPVDRIFDDKWAPLQGPALCVYN
NQPFTEDDVRGIQNLGKGTKEGNPYKTGQYGIGFNSVYHITDCPSFISGNDILCIFDP
HARYAPGATSISPGRMFRDLDADFRTQFSDVLDLYLGTHFKLDNCTMFRFPLRNAEMA
KVSEISSVPASDRMVQNLLDKLRSDGAELLMFLNHMEKISICEIDKSTGALNVLYSVK
GKITDGDRLKRKQFHASVIDSVTKKRQLKDIPVQQITYTMDTEDSEGNLTTWLICNRS
GFSSMEKVSKSVISAHKNQDITLFPRGGVAACITHNYKKPHRAFCFLPLSLETGLPFH
VNGHFALDSARRNLWRDDNGVGVRSDWNNSLMTALIAPAYVELLIQLKKRYFPGSDPT
LSVLQNTPIHVVKDTLKKFLSFFPVNRLDLQPDLYCLVKALYNCIHEDMKRLLPVVRA
PNIDGSDLHSAVIITWINMSTSNKTRPFFDNLLQDELQHLKNADYNITTRKTVAENVY
RLKHLLLEIGFNLVYNCDETANLYHCLIDADIPVSYVTPADIRSFLMTFSSPDTNCHI
GKLPCRLQQTNLKLFHSLKLLVDYCFKDAEENEIEVEGLPLLITLDSVLQTFDAKRPK
FLTTYHELIPSRKDLFMNTLYLKYSNILLNCKVAKVFDISSFADLLSSVLPREYKTKS
CTKWKDNFASESWLKNAWHFISESVSVKEDQEETKPTFDIVVDTLKDWALLPGTKFTV
SANQLVVPEGDVLLPLSLMHIAVFPNAQSDKVFHALMKAGCIQLALNKICSKDSAFVP
LLSCHTANIESPTSILKALHYMVQTSTFRAEKLVENDFEALLMYFNCNLNHLMSQDDI
KILKSLPCYKSISGRYVSIGKFGTCYVLTKSIPSAEVEKWTQSSSSAFLEEKIHLKEL
YEVIGCVPVDDLEVYLKHLLPKIENLSYDAKLEHLIYLKNRLSSAEELSEIKEQLFEK
LESLLIIHDANSRLKQAKHFYDRTVRVFEVMLPEKLFIPNDFFKKLEQLIKPKNHVTF
MTSWVEFLRNIGLKYILSQQQLLQFAKEISVRANTENWSKETLQNTVDILLHHIFQER
MDLLSGNFLKELSLIPFLCPERAPAEFIRFHPQYQEVNGTLPLIKFNGAQVNPKFKQC
DVLQLLWTSCPILPEKATPLSIKEQEGSDLGPQEQLEQVLNMLNVNLDPPLDKVINNC
RNICNITTLDEEMVKTRAKVLRSIYEFLSAEKREFRFQLRGVAFVMVEDGWKLLKPEE
VVINLEYESDFKPYLYKLPLELGTFHQLFKHLGTEDIISTKQYVEVLSRIFKNSEGKQ
LDPNEMRTVKRVVSGLFRSLQNDSVKVRSDLENVRDLALYLPSQDGRLVKSSILVFDD
APHYKSRIQGNIGVQMLVDLSQCYLGKDHGFHTKLIMLFPQKLRPRLLSSILEEQLDE
ETPKVCQFGALCSLQGRLQLLLSSEQFITGLIRIMKHENDNAFLANEEKAIRLCKALR
EGLKVSCFEKLQTTLRVKGFNPIPHSRSETFAFLKRFGNAVILLYIQHSDSKDINFLL
ALAMTLKSATDNLISDTSYLIAMLGCNDIYRIGEKLDSLGVKYDSSEPSKLELPMPGT
PIPAEIHYTLLMDPMNVFYPGEYVGYLVDAEGGDIYGSYQPTYTYAIIVQEVEREDAD
NSSFLGKIYQIDIGYSEYKIVSSLDLYKFSRPEESSQSRDSAPSTPTSPTEFLTPGLR
SIPPLFSGRESHKTSSKHQSPKKLKVNSLPEILKEVTSVVEQAWKLPESERKKIIRRL
YLKWHPDKNPENHDIANEVFKHLQNEINRLEKQAFLDQNADRASRRTFSTSASRFQSD
KYSFQRFYTSWNQEATSHKSERQQQNKEKCPPSAGQTYSQRFFVPPTFKSVGNPVEAR
RWLRQARANFSAARNDLHKNANEWVCFKCYLSTKLALIAADYAVRGKSDKDVKPTALA
QKIEEYSQQLEGLTNDVHTLEAYGVDSLKTRYPDLLPFPQIPNDRFTSEVAMRVMECT
ACIIIKLENFMQQKV"

BASE COUNT 4163 a 2256 c 2487 g 3887 tORIGIN
atgatttaca ggaagaccat gtactcagct gcagcttcta aatccagaac gatttgcacg
tcttatcaag gaagtaatga atacattctg gcctggcaga gaattgattg ttcaatggta
tccatttgat gaaaacagaa atcacccatc tgtttcatgg cttaagatgg tttggaaaaa
tctttatata cattttcag aggatttgac tttatttgat gagatgccac ttatccccag
aactatacta gaggaaggtc agacatgtgt ggaactcatt agactcagga ttccatcgtt
agtcatttta gacgatgaat ctgaagcaca gcttccagaa tttttagcag acattgtaca
aaaacttgga gggtttgtcc ttaaaaaatt agatgcatct atacaacatc cgcttattaa
aaaatatatt cattcaccat taccaagtgc tgttttgcag ataatggaga agatgccatt
gcagaaattg tgtaatcaaa taacttcgct acttccaaca cacaaagatg ccctgaggaa
gttcttggct agtttaaccg atagcagtga gaaagagaaa agaattattc aagaattggc
aatattcaag cgcattaacc attcttctga tcagggaatt tcctcttata caaaattgaa
aggttgtaaa gtcttacacc atactgccaa actcccagca gatctgcgac tttctatttc
agtaatagac agtagtgatg aagctactat tcgtctggca aacatgttga aaatagaaca
gttaaagacc actagctgct taaagcttgt tttaaaagat attgaaaatg cattttattc
acatgaagag gtaacacagc ttatgttatg ggtccttgag aatctatctt ctcttaaaaa

Figure 9B

OIPE JC99 NOV 21 2002 PATENT & TRADEMARK OFFICE

RECEIVED
NOV 26 2002
TECH CENTER 1600/2900

APPROVED BY DRAFTSMAN | O.G. FIG. | CLASS | SUBCLASS

tgagaatcca aatgtgcttg agtggttaac accattaaaa ttcatccaga tatcacagga
acagatggta tcagctggtg aactctttga ccctgatata gaagtactaa aggatctctt
ttgtaatgaa gaaggaacct atttcccacc ctcagttttt acctcaccag atattcttca
ctccttaaga cagattggtt taaaaaacga agccagtctc aaagaaaagg atgttgtgca
agtggcaaaa aaaattgaag ccttacaggt cggtgcttgt cctgatcaag atgttcttct
gaagaaagcc aaaaccctct tactggtttt aaataagaat cacacactgt tgcaatcatc
tgaaggaaag atgacattga agaaaataaa atgggttcca gcctgcaagg aaaggcctcc
aaattatcca ggctctttgg tctggaaagg agatctctgt aatctctgtg caccaccaga
tatgtgtgat gtaggccatg caattctcat tggctcctca cttcctcttg ttgaaagtat
ccatgtaaac ctggaaaaag cattagggat cttcacaaaa cctagcctta gtgctgtctt
aaaacacttt aaaattgttg ttgattggta ttcttcaaaa acctttagtg atgaagacta
ctatcaattc cagcatattt tgcttgagat ttacggattc atgcatgatc atctaaatga
agggaaagat tcttttagag ccttaaaatt tccatgggtt tggactggca aaaagttttg
tccacttgcc caggctgtga ttaaaccaat ccatgatctt gaccttcagc cttatttgca
taatgtacct aaaaccatgg caaaattcca ccaactattt aaggtctgtg gttcaataga
ggagttgaca tcagatcata tttccatggt tattcagaag atatatctca aaagtgacca
agatctcagt gaacaagaaa gcaaacaaaa tcttcatctt atgttgaata ttatcagatg
gctgtatagc aatcagattc cagcaagccc caacacacca gttcctatac atcatagcaa
aaatccttct aaacttatca tgaagccaat tcacgaatgc tgttattgtg acattaaagt
tgatgacctt aatgacttac ttgaagattc tgtggaacca atcattttgg tgcatgagga
catacccatg aaaactgcag aatggctaaa agttccatgc cttagtacaa gactgataaa
tcctgaaaac atgggatttg agcagtcagg acaaagagag ccacttactg taagaattaa
aaatattctg gaagaatacc cttcagtgtc agatattttt aaagaactac ttcaaaacgc
tgatgatgca aatgcaacag aatgcagttt cttgattgat atgagaagaa atatggacat
aagagagaat ctcctagacc cagggatggc agcttgtcat ggacctgctt tgtggtcatt
caacaattct caattctcag attcagattt tgtgaacata actaggttag gagaatcttt
aaaaagggga gaagttgaca aagttggaaa atttggtctt ggatttaatt ctgtgtacca
tatcactgac attcccatca ttatgagtcg ggaattcatg ataatgttcg atccaaacat
aaatcatatc agtaaacaca ttaaagacaa atccaatcct gggatcaaaa ttaattggag
taaacaacag aaaagactta gaaaatttcc taatcagttc aaaccattta tagatgtatt
tggctgtcag ttacctttga ctgtagaagc accttacagc tataatggaa ccctttccg
actgtccttt agaactcaac aggaagcaaa agtgagtgaa gttagtagta cgtgctacaa
tacagcagat atttattctc ttgtggatga atttagtctc tgtggacaca ggcttatcat
tttcactcag agtgtaaagt caatgtattt gaagtacttg aaaattgagg aaaccaaccc
cagtttagca caagatacag taataattaa aaaaaaatcc tgctcttcca aagcattgaa
cacacctgtc ttaagtgttt taaaagaggc tgctaagctc atgaagactt gcagcagcag
taataaaaag cttcccagtg atgaaccaaa gtcatcttgc attcttcaga tcacagtgga
agaatttcac catgtgttca gaaggattgc tgatttacag tcgccacttt ttagaggtcc
agatgatgac ccagctgctc tctttgaaat ggctaagtct ggccaatcaa aaaagccatc
agatgagttg tcacagaaaa cagtagagtg taccacgtgg cttctgtgta cttgcatgga
cacaggagag gctctgaagt tttccctgag tgagagtgga agaagactag gactggttcc
atgtggggca gtaggagttc agctgtcaga aatccaggac cagaagtgga cagtgaaacc
acacattgga gaggtgtttt gctatttacc tttacgaata aaaacaggct tgccagttca
tatcaatggg tgctttgctg ttacatcaaa taggaaagaa atctggaaaa cagatacaaa
aggacgatgg aataccacgt tcatgagaca tgttattgtg aaagcttact tacaggtact
gagtgtctta cgggacctgg ccactagtgg ggagctaatg gattatactt actatgcagt
atggcccgat cctgatttag ttcatgatga tttttctgta atttgccaag gattttatga
agatatagct catggaaaag ggaaagaact gaccaaagtc ttctctgatg gatctacttg
ggtttccatg aagaacgtaa gatttctaga tgactctata cttaaaagaa gagatgttgg
ttcagcagcc ttcaagatat ttttgaaata cctcaagaag actgggtcca aaaacctttg
tgctgttgaa cttccttctt cggtaaaatt aggatttgaa gaagctggct gcaaacagat
actacttgaa aacacatttt cagagaaaca gttttttttct gaagtgtttt ttccaaatat
tcaagaaatt gaagcagaac ttagagatcc tttaatgatc tttgttctaa atgaaaaagt
tgatgagttc tcgggagttc ttcgtgttac tccatgtatt ccttgttcct tggaggggca

Figure 9C

OIPE
NOV 21 2002
PATENT & TRADEMARK OFFICE
JC699

RECEIVED
NOV 26 2002
TECH CENTER 1600/2900

APPROVED BY DRAFTSMAN | O.G. FIG. | CLASS | SUBCLASS

tcctttggtt ttgccatcaa gattgatcca ccccgaagga cgagttgcaa agttatttga
tattaaagat gggagattcc cttatggttc tactcaggat tatctcaatc ctattatttt
gattaaacta gttcagttag gtatggcaaa agatgatatt ttatgggatg atatgctaga
acgtgcagtg tcagtagctg aaattaataa aagtgatcat gttgctgcat gcctaagaag
tagtatctta ttgagtctta tcgatgagaa actaaaaata agggatccta gagcaaagga
ttttgctgca aaatatcaaa caatccgctt ccttccattt ctgacaaaac cagcaggttt
ttctttggac tggaaaggca acagttttaa gcctgaaacc atgtttgcag caactgacct
ttatacagct gaacatcaag atatagtttg tcttttgcaa ccaattctaa atgaaaattc
ccattctttt agaggttgtg gttcagtgtc attggctgtt aaagagtttt tgggattact
caagaagcca acagttgatc tggttataaa ccaattgaaa gaagtagcaa aatcagttga
tgatggaatt acactgtacc aggagaatat caccaatgct tgctacaaat accttcatga
agccttgatg caaaatgaaa tcactaagat gtcaattatt gataagttaa aacccttag
cttcattcta gttgagaatg catatgttga ctcagaaaag gtttcttttc atttaaattt
tgaggcggca ccataccttt atcagttgcc taataagtat aaaaataatt tccgcgaact
ttttgaaacc gtgggtgtga ggcagtcatg cactgttgaa gattttgctc ttgttttgga
atctattgat caagaaagag gaacaaagca aataacagaa gagaattttc agctttgccg
acgaataatc agtgaaggaa tatggagtct cattagagaa aagaaacaag aattttgtga
gaaaaattat ggcaagatat tattgccaga tactaatctt atgcttctcc ctgctaaatc
gttatgctac aatgattgcc cttggataaa agtaaaggat accactgtaa aatattgtca
tgctgacata cccagggaag tagcagtaaa actaggagca gtcccaaagc gacacaaagc
cttagaaaga tatgcatcca atgtctgttt tacaacactt ggcacagaat ttgggcagaa
agaaaaattg accagcagaa ttaagagcat ccttaatgca tatccttctg aaaaggaaat
gttgaaagag cttcttcaaa atgctgatga tgcaaaggcg acagaaatct gttttgtgtt
tgatcctaga cagcatccag ttgatagaat atttgatgat aagtgggccc cattgcaagg
gccagcactt tgtgtgtaca acaaccagcc atttacagaa gatgatgtta gaggaattca
gaatcttgga aaaggcacga aagagggaaa tccttataaa actggacagt atggaatagg
attcaattct gtgtatcata tcacagactg cccatctttt atttctggca atgacatcct
gtgtattttt gatcctcatg ccagatatgc accaggggcc acatccatta gtcccggacg
catgtttaga gatttggatg cagattttag gacacagttc tcagatgttc tggatcttta
tctgggaacc cattttaaac tggataattg cacaatgttc agatttcctc ttcgtaatgc
agaaatggca aaagtttcgg aaatttcgtc tgttccagca tcagacagaa tggtccagaa
tcttttggac aaactgcgct cagatggggc agaacttcta atgtttctta atcacatgga
aaaaatttct atttgtgaaa tagataagag tactggagct ctaaatgtgc tgtattcagt
aaagggcaaa atcacagatg gagacagatt gaaaaggaaa caatttcatg catctgtaat
tgatagtgtt actaaaaaga ggcagctcaa agacatacca gttcaacaaa taacctatac
tatggatact gaggactctg aaggaaatct tactacgtgg ctaatttgta atagatcagg
cttttcaagt atggagaaag tatctaaaag tgtcatatca gctcacaaga accaagatat
tactcttttc ccacgtggtg gagtagctgc ctgcattact cacaactata aaaaacccca
tagggccttc tgtttttttgc ctctttcttt ggagactggg ctgccatttc atgtgaatgg
ccactttgca ctggattcag ccagaaggaa cctgtggcgt gatgataatg gagttggtgt
tcgaagtgac tggaataaca gtttaatgac agcattaata gctcctgcat atgttgaatt
gctaatacag ttaaaaaaac ggtatttccc tggttctgat ccaacattat cagtgttaca
gaacacccct attcatgttg taaaggacac tttaaagaag tttttatcgt ttttcccagt
taaccgtctt gatctacagc cagatttata ttgtctagtg aaagcacttt acaattgcat
tcacgaagac atgaaacgtc ttttacctgt tgtgcgggct ccaaatattg atggctctga
cttgcactct gcagttataa ttacttggat caatatgtct acttctaata aaactagacc
attttttgac aatttactac aggatgaatt acaacacctt aaaaatgcag attataatat
caccacacgc aaaacagtag cagagaatgt ctataggctg aaacatctcc ttttagaaat
tggtttcaac ttggtttata actgtgatga aactgctaat ctttaccact gtcttataga
tgcagatatt cctgttagtt atgtgacccc tgctgatatc agatcttttt taatgacatt
ttcctctcct gacactaatt gccatattgg gaagctgcct tgtcgtctgc agcagactaa
tctaaaactt tttcatagtt taaaactttt agttgattat tgttttaaag atgcagaaga
aaatgagatt gaagttgagg gattgcccct tctcatcaca ctggacagtg ttttgcaaac
ttttgatgca aaacgaccca agtttctaac aacatatcat gaattgattc catcccgcaa

Figure 9D

OIPE
NOV 21 2002
PATENT & TRADEMARK OFFICE

RECEIVED
NOV 26 2002
TECH CENTER 1600/2900

O.G. FIG.
APPROVED BY DRAFTSMAN
CLASS
SUBCLASS

agacttgttt atgaatacat tatatttgaa atatagtaat attttattga actgtaaagt
tgcaaaagtg tttgacattt ccagctttgc tgatttgtta tcctctgtgt tgcctcgaga
atataagacc aaaagttgca caaagtggaa agacaatttt gcaagtgagt cttggcttaa
gaatgcatgg cattttatta gtgaatctgt aagtgtgaaa gaagatcagg aagaaacaaa
accaacattt gacattgttg ttgatactct aaaagactgg gcattgcttc caggaacaaa
gtttactgtt tcagccaacc agcttgtggt tcctgaagga gatgttctgc ttcctctcag
ccttatgcac attgcagttt ttccaaatgc ccagagtgat aaagtttttc atgctctaat
gaaagccggc tgtattcagc ttgctttgaa caaaatctgt tccaaagaca gtgcatttgt
tcctttgttg tcatgtcaca cagcaaatat agagagcccc acaagcatct tgaaggctct
acattatatg gtccaaactt caacatttag agcagaaaaa ttagtagaaa atgattttga
ggcacttttg atgtatttca actgcaattt gaatcatttg atgtcccaag atgatataaa
aattctaaag tcacttccgt gctataaatc catcagtggc cgctatgtaa gcattggaaa
atttggaaca tgctacgtac ttacaaaaag tatcccttca gctgaagtgg agaaatggac
acaatcatca tcatctgcat ttcttgaaga aaaaatacac ttaaaagaac tatatgaggt
gattggttgt gtacctgtag atgatcttga ggtatatttg aaacacctct taccaaaaat
tgaaaatctc tcttatgatg caaaattaga gcacttgatc taccttaaga atagattatc
aagtgctgag gaattatcag agattaagga acaacttttt gaaaaactgg aaagtttatt
gataatccat gatgctaaca gtagactaaa gcaagcaaag catttctatg atagaactgt
gagagttttt gaagttatgc ttcctgaaaa attgtttatt cctaatgatt tctttaagaa
attggaacaa cttataaaac ccaaaaatca tgttacattt atgacatcct gggtggaatt
cttaagaaat attggactaa aatacatact ttctcagcag cagttgttac agtttgctaa
ggaaatcagt gtgagggcta atacagaaaa ctggtccaaa gaaacattgc aaaatacagt
tgatatcctt ctgcatcata tattccaaga acgaatggat ttgttatctg gaaattttct
gaaagaacta tctttaatac cattcttatg tcctgagcgg gcccccgcgg aattcattag
atttcatcct caatatcaag aggtaaatgg aacacttcct cttataaagt tcaatggagc
acaggtaaat ccaaaattca agcaatgtga tgtactccag ctgttatgga catcctgccc
tattcttcca gagaaagcta cacccttaag cattaaagaa caagaaggta gtgaccttgg
tccacaagaa cagcttgaac aagttttaaa tatgcttaat gttaacctgg atcctcctct
tgataaggta atcaataact gcagaaacat atgcaacata acgacgttgg atgaagaaat
ggtaaaaact agagcaaaag tcttaaggag catatatgaa ttcctcagtg cagaaaaaag
ggaatttcgt tttcagttgc gaggggttgc ttttgtgatg gtagaagatg gttggaaact
tctgaagcct gaggaggtag tcataaacct agaatatgaa tctgatttta aaccttattt
gtacaagcta cctttagaac ttggcacatt tcaccagttg ttcaaacact taggtactga
agatattatt tcaactaagc aatatgttga agtgttgagc cgcatattta aaaattctga
gggcaaacaa ttagatccta atgaaatgcg tacagttaag agagtagttt ctggtctgtt
caggagtcta cagaatgatt cagtcaaggt gaggagtgat ctcgagaatg tacgagacct
tgcgctttac ctcccaagcc aggatggtag attggtaaag tcaagcatct tagtgtttga
cgatgcgcca cattataaaa gtagaatcca ggggaatatt ggtgtgcaaa tgttagttga
tctcagccag tgctacttag ggaaagacca tggatttcac actaagttga taatgctctt
tcctcaaaaa cttagacctc gattattgag cagtatactt gaagaacaat tagatgaaga
gactcccaaa gtttgtcagt ttggagcgtt gtgttctctt caaggaagat tgcagttact
cttgtcttct gaacagttca ttacaggact gattagaatt atgaagcatg aaaatgataa
tgcttttctg gccaatgaag aaaaagccat aagactttgc aaagccctaa gagaaggatt
gaaagtatcc tgctttgaaa agcttcaaac aacattaaga gttaaaggtt ttaatcctat
tccccacagc agaagtgaaa cttttgcttt tttgaagcga tttggtaatg cagtcatctt
gctctacatt caacattcag acagtaaaga cattaatttc ctgttagcac tggcaatgac
tcttaaatca gcaactgaca atttgatttc tgacacttca tatttaattg ctatgctagg
atgcaatgat atttacagga ttggtgagaa acttgacagt ttaggagtga aatatgactc
ttcggagcca tcaaaactgg aacttccaat gcctggcaca ccaattcctg ctgaaattca
ttacactctg cttatggacc caatgaatgt tttttacccg ggagaatatg ttgggtacct
tgttgatgct gaaggtggtg atatctatgg atcataccag ccaacataca catatgcaat
tattgtacaa gaagttgaaa gagaagatgc tgacaattct agttttctag gaaagatata
tcagatagat attggttata gtgaatataa aatagttagc tctcttgatc tgtataagtt
ttcaagacct gaggaaagct ctcaaagcag ggacagtgct ccttctacac caaccagccc

Figure 9E

DIPE
NOV 21 2002
PATENT & TRADEMARK OFFICE

RECEIVED
NOV 26 2002
TECH CENTER 1600/2900

APPROVED BY DRAFTSMAN | O.G. FIG. | CLASS | SUBCLASS

cactgagttc ctcacccctg gcctgagaag cattcctcct cttttctctg gtagagagag
ccacaagact tcttccaaac atcagtcccc caaaaagctt aaggttaatt ctttaccaga
aatcttaaaa gaagtgacat ctgtggtgga gcaagcatgg aagcttccag aatcggaacg
aaaaaagatt attaggcggt tgtatttgaa atggcatcct gacaaaaatc cagagaacca
tgacattgcc aatgaagttt ttaaacattt gcagaatgaa atcaacagat tagaaaaaca
ggcttttcta gatcaaaatg cagacagggc ctccagacga acattttcaa cctcagcatc
ccgatttcag tcagacaaat actcatttca gagattctat acttcatgga atcaagaagc
aacgagccat aaatctgaaa gacagcaaca gaacaaagaa aaatgccccc cttcagccgg
acagacttac tctcaaaggt tctttgttcc tcccactttc aagtcggttg gcaatccagt
ggaagcacgc agatggctaa gacaagccag agcaaacttc tcagctgcca ggaatgacct
tcataaaaat gccaatgagt gggtgtgctt taaatgttac ctttctacca agttagcttt
gattgcagct gactatgctg tgaggggaaa gtctgataaa gatgtaaaac caactgcact
tgctcagaaa atagaggaat atagtcagca acttgaagga ctgacaaatg atgttcacac
attggaagct tatggtgtag acagtttaaa aacaagatac cctgatttgc ttccctttcc
tcagatccca aatgacaggt tcacttctga ggttgctatg agggtgatgg aatgtactgc
ctgtatcata ataaaacttg aaaatttttat gcaacaaaaa gtgtgaagat atttaacgaa
aaaaaaggta gatcttgaat gtgttgtagc acgaataaat tgctgtactt cattaagctt
cattgccaat tagctaggaa ttgttaagca cattgcagat tgttcttgga gaattctgga
gttgttatga acatgaatac caacggaaaa ccttaactga atctaaaaga aaactatttt
gaagatggtg gtgagctgca aaatagctgg atggatttga atgattggga tgatacatca
ttgaactgca ctttatataa ccaaagctta gcagtttgtt agataagagt ctatgtatgt
ctctggttag gatgaagtta attttatgtt tttaacatgg tatttttgaa ggagctaatg
aaacactgga catataattg gtttaaacat aaggggaatt aagtctttgt agtctgtcat
ttttttaagt ggatcctctt ggatgcgtta ttttctcatc agctggctct gatcatgaat
ttgttgtaat tttatgttgt actcagtgca tttaagaaat ggtagagtat tttaatccta
ttacttgact aagagtgtga aggtagtact ttttagagtg cactgagtgc actttacatc
tttatttaaa tttttttta acatcttatg tttacaggct tcctgtttga tgaagatagc
aacggaaaac tcaaaatggt ggcagttctt attaccagtt gttagtattg tttctggaaa
ctgcttgcca agacaacatt tattaactgt tagaacactt gctttatgtt tgtgtgtaca
tattttccac aaatgttata atttatatag tgtggttgaa caggatgcaa tcttttgttg
tctaaaggtg ctgcagttaa aaaaaaaaca acctttttctt tcaatatggc atgtagtgga
gtttttttaa ctttaaaaac atcaaaaatt gttaaaatca ttgtgttatc tagtagttta
taattatcgg cttatatttc cccatgaatg atcagaactg acatttaatt catgtttgtc
tcgccatgct tctttacttt aacatatttc ttttgcagaa tgtaaaaggt aatgataatt
agtttatata agtgtactgg ctgtaaatga tgctaaatat actttatgca attaagggct
tacagaacat gttgaaactt tttttacttt tattgggaat aaggaatgtt tgcacctcca
cattttattg ctt

Figure 9F